Kidney International (2006) **69,** 1290. doi 10.1038/sj.ki.5000413

Infection hunter: gallium scintigraphy for hemodialysis access graft infection

J-S Chiu[1,2], J-E Tzeng[2,3] and Y-F Wang[1,2]

[1]Department of Nuclear Medicine, Buddhist Dalin Tzu Chi General Hospital, Chiayl, Taiwan; [2]Department of Medicine, Tzu Chi University, Hualien, Taiwan; and [3]Department of Pathology, Dalin Tzu Chi General Hospital, Chiayi, Taiwan

Correspondence: *Y-F Wang, Department of Nuclear Medicine, Buddhist Dalin Tzu Chi General Hospital, No. 2, Minsheng Road, Dalin Township, Chiayi County 622, Taiwan. E-mail: nment@ms7.hinet.net*

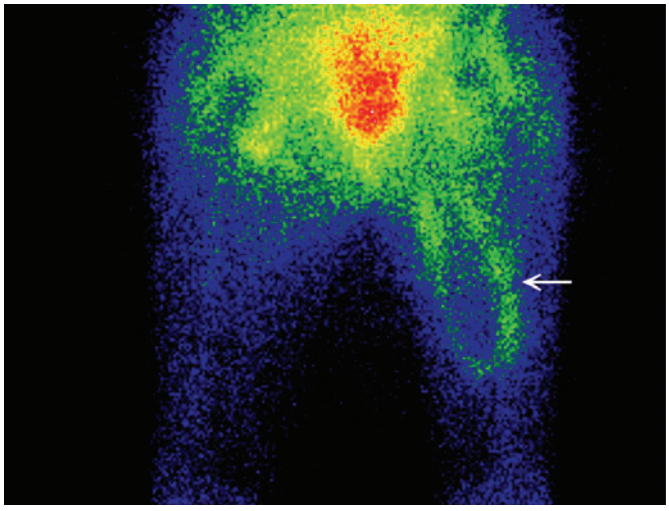

Figure 1 | Radionuclide imaging of infection. Gallium scintigraphy demonstrated prominent visualization of the hemodialysis access graft (arrow) in the left thigh.

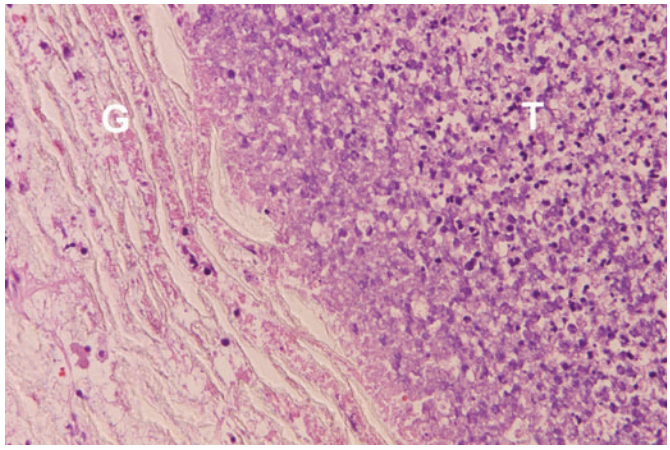

Figure 2 | Pathological findings. A pathological section of the resected hemodialysis access graft revealed a graft vascular wall (G) containing acute inflammatory cells. Aggregated inflammatory cells occluding the vascular lumen as a thrombus (T) also were noted. (Hematoxylin and eosin, original magnification ×400.)

A 66-year-old female was admitted to the Department of Nephrology because of fever that was not associated with other symptoms. She had had end-stage renal disease requiring maintenance hemodialysis for the previous 12 years. The physical examination was unremarkable. X-rays of the chest and abdomen were normal. Blood cultures grew *Staphylococcus aureus*. Gallium scintigraphy was performed, following intravenous injection of 3 mCi gallium-67 citrate. The static image at 6 hours showed a focal area of increased radiotracer activity, revealing the exterior of the hemodialysis access graft in the left thigh (Figure 1). The patient underwent emergency resection of the infected graft, and the resulting culture also was positive for *S. aureus*. Pathology showed acute inflammatory cells infiltrating the graft vascular wall and peri-graft soft tissue (Figure 2). After surgery and antibiotic therapy, the fever subsided. Infectious complications of vascular access sites are possible sources of bacteremia in every hemodialysis patient, and any patient may present with fever in the absence of local infectious signs. The usefulness of gallium scintigraphy in locating the site of infection was confirmed by our patient's pathological findings. The delivery and accumulation of transferrin-bound gallium-67 are intensified with increased blood flow and vascular membrane permeability at inflammatory foci. Gallium-67 may be transported bound to the intracellular lactoferrin of leukocytes. Moreover, leukocytes can release lactoferrin to bind gallium-67. The siderophore of pathogenic bacteria also has a high affinity for gallium-67, forming a complex that is phagocytosed by macrophages. Gallium scintigraphy is useful in the early detection of hemodialysis access graft infection.